January 2021

ADJUSTABLE PERFORMANCE CLICK PAD DESIGN FOR DIFFERENT NB SYSTEM

HP INC

Adjustable Performance Click Pad design for different NB system

Abstract

This idea is by hinge design and adjustable process to change module performance for different NB product request. Keep same material and assembly process and only need to dispense glue position to change click performance. This method can leverage same design and material for different NB product then achieve material and facility process cost saving.

Background

Currently click pad design is based on different NB system request to design different hinge structure, if system click performance too light or heavy, module level need to fine tune hinge adhesive area or thickness to meet system request. For next phase, if system structure and deformation direction change that will impact click performance, then module level must fine tune hinge adhesive area, location and thickness again. Of cause, for different NB product has different request and hinge design must modify and verify until meet system spec. these are huge process and waste a lot of money, time and resources. Click Pad design is very simply, they are assembly by PCBA, hinge, support bracket and dome. Click Pad performance is based on hinge design and dome select to decide. Hinge design purpose is connection between PCBA and support bracket. Another is help adjustable click pad performance by hinge adhesive area and strength. Most of the design is fine tune hinge design to adjust click pad performance. Any change should be re-preparing material and verify until meet system request.

Invention Description

This idea is design very light force hinge that can help module level performance close to dome spec. We can ignore the impact of hinge on module level performance. This advantage is that we can choose the suitable dome and spec is same with module level. This hinge design is paste adhesive on both sides of plastic sheet and adhesive position need to overlap. The best ratio is 1.5 : 1(overlap) : 1.5. Refer to Fig. 1 1.5 : 1 : 1.5 ratio hinge design. Verified it from real sample and compare with dome spec. Refer to Table 1 Dome and module level measure result.

For adjustable performance design, it digs some holes on the adhesive of the hinge then these glue will be bonding between hinge and support bracket. Add glue on these holes to adjust performance, because we knew if want to increase performance that should add adhesive area or hinge strength, but this idea only use glue to enhance adhesive strength. And we also can depend on request to add different glue point quantity. Refer to Fig. 2 Add different glue quantity design. We also verify on real sample. Refer to Table 2 Different glue quantity and result.

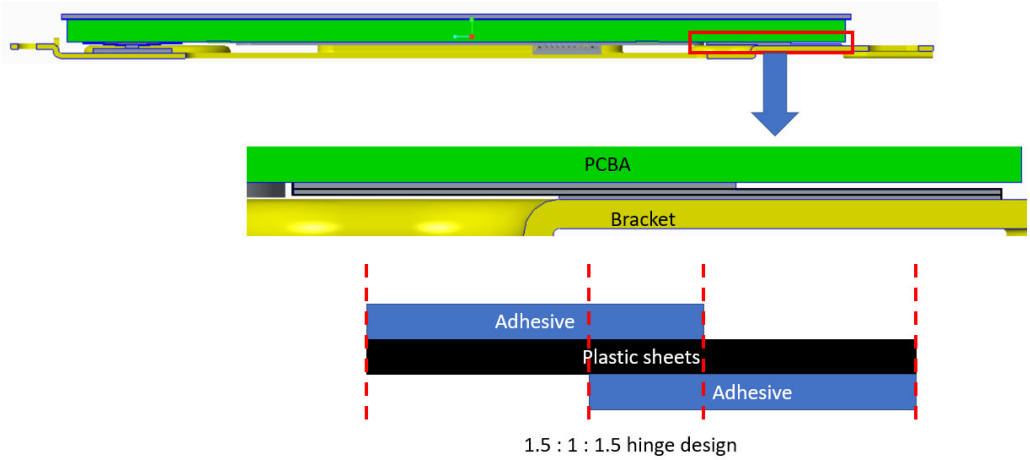

Fig. 1 “1.5 : 1 : 1.5” ratio hinge design

Verify 100 pcs	Dome	Module Level
Force range (g)	160 ~ 170	161 ~ 169
Force average (g)	166	167

Table. 1 Dome and module level measure result.

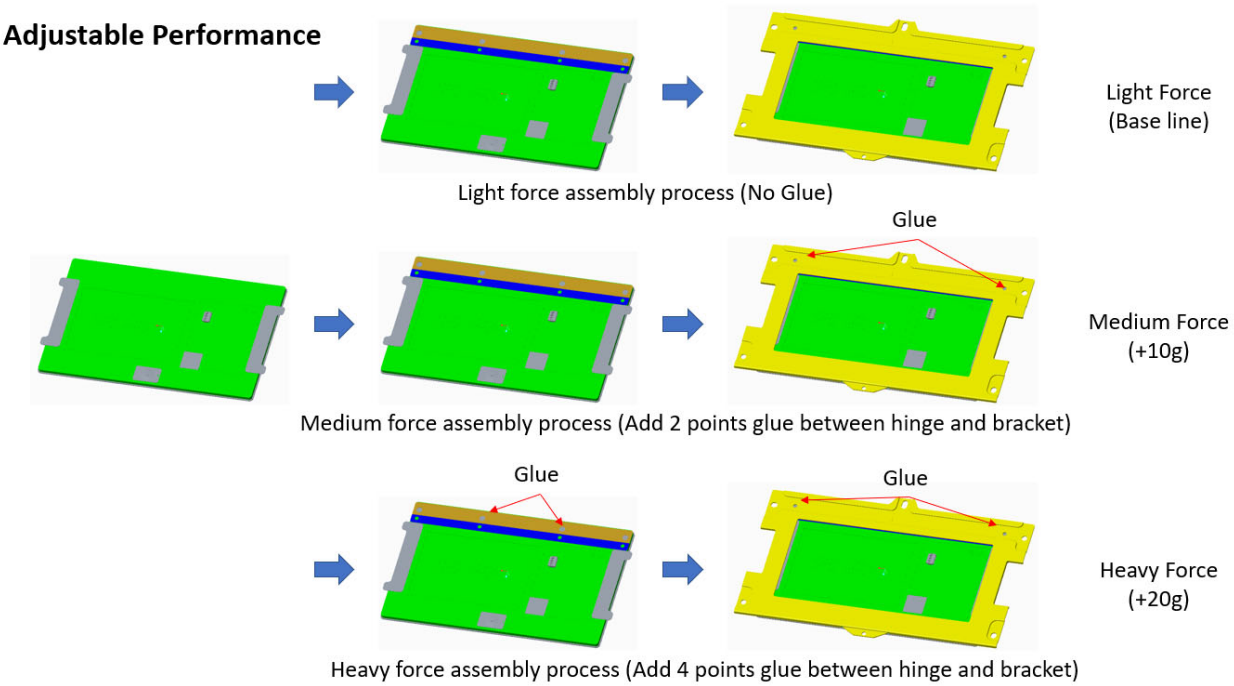

Fig. 2 Add different glue quantity and result

Verify 200 pcs	Dome	Module Level (Add 2 points glue)	Module Level (Add 4 points glue)
Force range (g)	160 ~ 170	169 ~ 181	180 ~ 200
Force average (g)	166	176.11	188.1

Table 2 Different glue quantity and result.

Advantages

- Keep same material and process for different system click performance request. That can leverage sample module design for different product then cost saving.
- Verify simply to adjust click pad performance to reduce resource and time.
- Has been completed all test and mass production, no quality concern.

Disclosed by Danny Ding HP Inc.